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Satisfaction with reduced dentitions in elderly people

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SUMMARY Natural dentitions of elderly people are often reduced and the remaining teeth are heavily restored. It is unknown whether they are satisfied or dissatisfied with this situation. To get more insight into this phenomenon 320 dentate non-institutionalized elderly subjects were clinically examined and interviewed by means of a questionnaire. Analysis of the data showed that only 13% of the subjects had at least a complete dentition from the right first molar to the left first molar; 50% had less than four occlusal units, 39% of the subjects were wearing a removable partial denture. Ninety per cent of the subjects was satisfied with the dental state and nearly all subjects mentioned they could chew well (97%), despite the fact that 91% of the subjects mentioned they had to deal with one or more dental discomforts. Satisfaction decreased significantly when the number of the occlusal units was reduced or a removable partial denture was present. The conclusion is drawn that although the dentitions of the elderly are often reduced they are, in general, satisfied with their dental state.

Introduction

More often than in the past elderly people retain their natural dentition due to changed patterns of dental awareness and increased fluoride use (Leake, 1988; Hellden, Salonen & Gustafsson, 1989; Palmqvist, Söderfeldt & Arnbjerg, 1991). Since these dentitions often have reduced numbers of teeth, and periodontal tissues in less than optimal condition, this fact has implications for dental treatment. On the one hand, complete rehabilitation of the dental arches is often impossible or undesirable due to the physical and mental condition of the subjects or for financial reasons and, on the other hand, edentulousness should be avoided. An important guideline is to maintain an adequate level of oral function with enough occluding teeth to avoid drastic changes in the mouth (Ettinger, 1987). Käyser (1981) promoted a treatment concept focusing on strategic parts of the dentition in this respect. Witter and co-workers (Witter, Van Elteren and Käyser, 1987, 1988; Witter *et al.*, 1990, 1991) reported positive results with this approach in an adult population. Whether this strategy is also valid in the elderly is not clear.

To get better insight into this problem, the opinion of elderly subjects regarding their present dental state is important. Several studies have dealt with this subject. Some of them, however, included edentulous subjects (Barenthin, 1977; Berkey, Call & Loupe, 1985), while other studies only related satisfaction with the number of decayed and missing teeth (Barenthin, 1977; Giddon, 1978; Reisine & Bailit, 1980). The latter found that satisfaction decreases with the number of decayed and missing teeth, but they did not investigate satisfaction in relation to the functional aspects of the remaining dentition.

The purpose of this study was to investigate the satisfaction with reduced dentitions in elderly subjects, especially in relation to the number of occlusal units.

Material and methods

A cross-sectional study was carried out among dentate,

non-institutionalized elderly subjects between 55 and 74 years of age, living in Zwolle, a representative city in the Netherlands (90 000 inhabitants). A name list of 3453 subjects was selected by the city registration office. Since age, sex and social economic status (SES) are often important interfering factors on dental behaviour, two equal-sized age and sex categories were chosen, and subjects in four different residential areas included to obtain a representative sample. All subjects from the name list were personally called after an introduction letter was sent to them. After excluding 1887 subjects who could not be reached (subjects who did not have a telephone, whose addresses were incorrect, or who were not at home), 1134 subjects who appeared to have a complete denture in the maxilla and/or the mandible, and 112 subjects who refused to participate, 320 subjects remained who had a natural dentition in both jaws and wanted to participate. They were examined near their home in a dental car. One hundred and eleven of them were between 55 and 59 years of age, 130 between 60 and 64 and 88 between 65 and 74. One hundred and thirty-five of the 329 subjects were male and 194 female.

The study involved a clinical examination and a questionnaire. The clinical examination contained items concerning the presence and quality of the teeth, the number of occlusal units, and the presence and design of a removable partial denture (RPD). An occlusal unit is, in this context, defined as a 'pair of occluding teeth in the posterior region'. In case both occluding teeth were natural teeth, the unit was scored as a 'natural occlusal unit'; in case one tooth was artificial or both teeth were artificial, the occlusal unit was scored as 'artificial'. For analyses a total score for the dentition was made. '*No units*' was scored when, at both posterior sites, no occlusal units existed. '*Few units*' was scored when, at one site, no units existed and at the other one to four, or when, at both sites, no more than two units existed. '*Moderate units*' was scored when, at one site, at least one occlusal unit existed and, at the other, at least three units. A '*complete dentition*' was scored when there was a complete dentition from the right first molar to the left first molar in the maxilla and mandible.

The questionnaire contained questions with preceded answers with respect to subjects' opinion about the function of the dentition and of the RPD. Besides questions on general satisfaction with the dental state specific questions were asked concerning comfort, chewing, aesthetics, speech, dental experiences in the past and dental attitude.

For analysis of the relationship of satisfaction with other variables a 'general satisfaction' scale was constructed by factor analysis using 11 questions out of the questionnaire. The scale was a sum score of questions regarding problems and complaints with the dental state and questions regarding chewing, appearance, speech and perception of oral health. The reliability analysis showed a Cronbach's alpha of 0·75 for the scale. Statistical analyses were performed using a *t*-test and variance analysis.

Results

Clinical state of the dentition

Figures 1 and 2 show the distribution of the present teeth and teeth replaced by an RPD or bridge dummies. Natural teeth appeared to be most often present in the

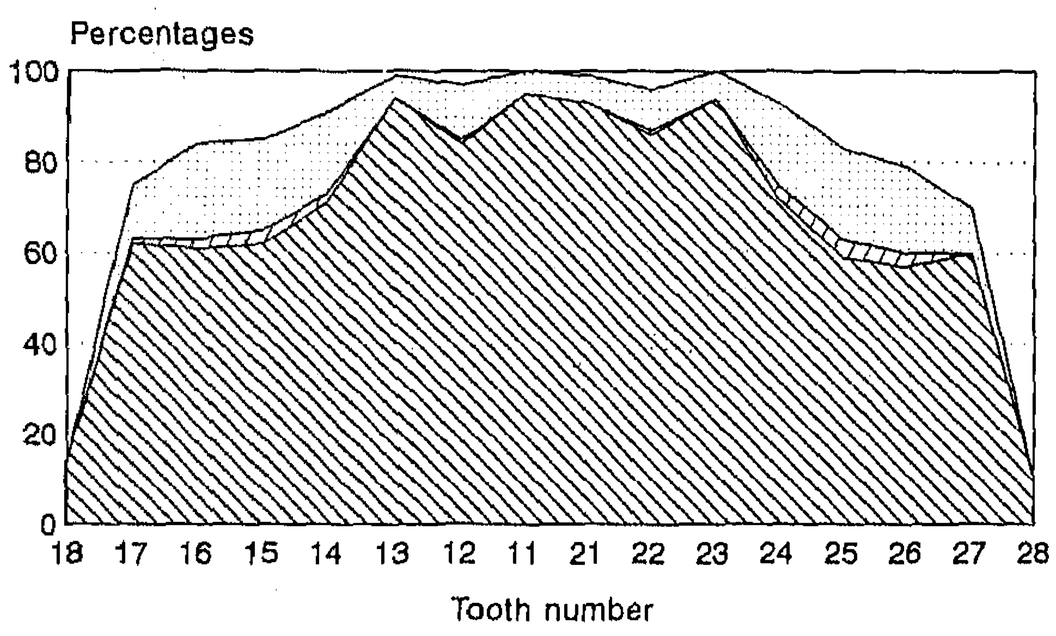

Fig. 1. A graphic presentation of the presence of teeth, the teeth replaced by an RPD, and the presence of a fixed bridge dummy for the maxilla (F.D.I. notation). ▧, present teeth; ▨, replaced by dummy; ▣, replaced by RPD.

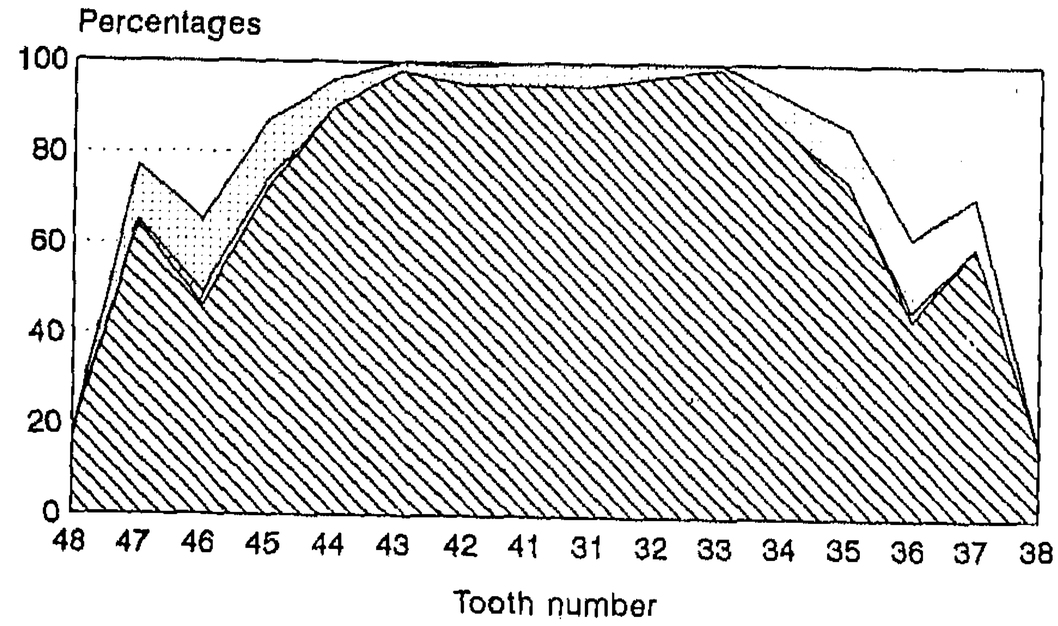

Fig. 2. A graphic presentation of the presence of teeth, the teeth replaced by an RPD, and the presence of a fixed bridge dummy for the mandible (F.D.I. notation). ▧, present teeth; ▨, replaced by dummy; ▣, replaced by RPD.

frontal region. RPDs replaced teeth most often in the posterior regions: in 20% of the subjects in the maxilla and 15% in the mandible. Molars were not replaced in 20% of the subjects in the maxilla and in almost 40% in the mandible. The anterior teeth and the first premolars were almost always replaced if not present.

The average number of the occlusal units per subject was 4·1. Table 1 shows that 13% of the subjects had a complete dentition and 50% of the subjects had no or few units (less than four). When natural and artificial teeth are taken together, this resulted in more occluding units: the highest percentage contained the category with four to seven occlusal units (moderate units).

Thirty-nine per cent of the subjects were wearing an RPD, of which 61% were acrylic dentures and 64% of free-end design. Anterior replacements were present in 39%. The degree of dental care was high (52% of the teeth were restored), but the need for restoration was low (76% did not need any restoration in the coronal part of the tooth and 88% not in the root part). Eight per cent of the subjects had more than one tooth with a pocket above 5 mm. Attrition and abrasion were common features, and extreme wear seldom occurred (5%).

Opinion about the dental state

The answers to the questions with respect to general satisfaction with the dentition and functioning of the dentition are shown in Table 2. Ninety per cent of the subjects gave a positive answer on the question if they were satisfied with their dental state, 15% mentioned they could not bite hard foods and 29% was not satisfied with their dental appearance. Problems with speech seldom occurred.

Regarding the question 'Have you had any complaints in the last year caused by toothache, broken fillings or something else?', 53% answered negatively and 47% positively. Dental discomforts — referring to some inconveniences like food packing, tooth mobility, painful teeth when eating hot or cold food — were frequently mentioned: 16% of the subjects reported several discomforts and 9% of subjects did not have any discomfort experiences. This means that 91% reported at least one discomfort.

Eighty-five per cent of the subjects assessed their oral health as 'good' or 'fair'. Compared to other people, 86% thought they were in a better dental state. Fifty-nine per cent of the subjects mentioned that they had never had any problems with their dentition in the past and for 65% of the subjects the last tooth extraction was more than 3 years ago. Most subjects visited their dentist at least once a year (86%).

Relationship between satisfaction and the dental state

Table 3 shows the relationship between the scores on the 'general satisfaction' scale and the number of occlusal units for natural dentitions and the presence of a partial denture. It appears that general satisfaction rose significantly with the increasing number of occlusal units both for subjects with a natural dentition and for subjects with a partial denture. Both variables had a significant effect on general satisfaction (ANOVA, $P=$

Table 1. Distribution of the subjects according to the number of natural and artificial occlusal units

	Natural units		Natural and artificial units	
No units	28	9%	12	4%
Few units	132	41%	93	29%
Moderate units	120	38%	175	55%
Complete dentition	40	13%	40	13%
Total	320	100%	320	100%

Table 2. Answers to questions regarding the subjects' opinion about the functioning of the dentition

Are you satisfied with your dental state?
very satisfied 30%, satisfied 60%, not satisfied 10%
Can you chew all your foods well?
yes 97%, no 3%
Can you bite hard food such as apples?
yes 85%, no 15%
Are you satisfied with your dental appearance?
very satisfied 14%, satisfied 57%, not satisfied 29%
Do you have problems with speech?
no 88%, sometimes 10%, frequently 2%

Table 3. The average general satisfaction scores according to the number of the occlusal natural units in the dentition and the presence of an RPD

	Natural dentition N = 193	RPD wearer N = 127	Total N = 320
No units	7·7	4·8	6·3
Few units	11·1	9·6	10·3
Moderate units	12·1	10·4	11·4
Complete dentition	14·0	—	14·0
Total	12·1	9·8	11·2

0·001 and $P = 0·01$). No interaction between these variables was present, which means that type and design of the RPD and the number of occlusal units did not increase or decrease each other's effects. A significant difference also existed between the general satisfaction scores of the subjects with and without an RPD (*t*-test, $P < 0·05$).

Discussion

In studies of the dental state and satisfaction in elderly people edentulous people are usually included. The comparison with studies is therefore difficult. Apart from this, most studies differ due to variations in selection and stratification of subjects and demographic patterns. The selective character of this sample could also play a role in explaining differences between the results of this study and data from the literature. No comparison with data in the literature, therefore, is made.

Only 13% of the subjects had a complete dentition from the right first molar to the left first molar. The dentition of 39% of the subjects was in such a condition that an RPD was applied. Many reduced dentitions were present. In spite of this, 90% of the subjects were satisfied with their dental state and 97% could chew well.

Although many subjects were satisfied, half of them mentioned having some complaints last year and 91% of the subjects reported to one or more discomforts. The explanation for this phenomenon could be that elderly people do not directly relate being satisfied to existing dental complaints: the attitude of elderly subjects towards oral health might rather be a reflection of their general acceptance of decreasing health (Kiyak, 1981). Another reason might be the influence of good general health. A study by Tornstam (1975) showed that the presence of a serious disease is one of the most important determinants for perceived subjective health. A high percentage of subjects in this study considered themselves in good general health (Meeuwissen, 1992); this suggests a high level of psychological well-being and may be an explanation of the high general satisfaction scores.

Most subjects had a positive attitude towards their dental state and had hardly any problems in the past: they had their dentition regularly checked by a dentist. This suggests that the dental situation already existed for a longer period and could be considered stable. This cannot be proven, however, since this was a cross-sectional study.

Several studies (Helkimo, Carlsson & Helkimo, 1978; Chauncey *et al.*, 1981) found that the objective chewing performance decreases with the number of teeth and age. Elderly people need more chewing strokes before the swallowing threshold is reached and the particle size is bigger when swallowing (Agerberg & Carlsson, 1981; Gunne, 1985; Idowu, Graser & Handelman, 1986). For these reasons one would expect a lower percentage of subjects in this study who are satisfied with their chewing ability, but this was not found. This finding can be explained by the phenomenon often found in the literature that patients' opinions regarding their chewing function does not agree with the results of objective tests (Agerberg & Carlsson,1981; Wayler & Chauncey, 1983; Slagter *et al.*, 1992).

Subjects with few natural occlusal units or with an RPD had lower scores on the 'general satisfaction' scale. The satisfaction scores between subjects with few and moderate occlusal units, however, hardly differed. A significant change appears when no units are present. This agrees with the results of Witter *et al.* (1990).

Subjects with an RPD were less satisfied than subjects with a natural dentition. The findings confirm the results of other studies: partial dentures often give problems, especially dentures with free-end saddles (Chandler & Brudvik, 1984; Watson *et al.*, 1986) or acrylic dentures (Watson *et al.*, 1986). Both types are often present in this sample. Reduced dentitions without replacement of the missing teeth by an RPD, however, only give problems when the number of occlusal units is too small (Witter *et al.*, 1987, 1988, 1990, 1991).

Conclusions

In this study amongst elderly people most subjects were satisfied with the present dental state, although many dentitions were reduced. They judged the chewing function and speech as good. Discomforts, however, were often mentioned.

Most of the subjects had a positive attitude towards their dental state: they were regular dental visitors and had hardly any problems in the past.

Subjects with few natural occlusal units, or with an RPD, were less satisfied with their dental state.

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